Soil Conservation
June 1978
U.S. Department of Agriculture

From the Administrator

Windbreaks: Fact and Fancy

Are windbreaks on the way out as a conservation practice in the Plains?

This was the question raised at a recent symposium sponsored by the Great Plains Agricultural Council.

For the Plains as a whole, the answer is no.

But conservationists need to be sure of the answer in each county. More importantly, they need to be certain each acre is protected from wind erosion by some kind of conservation system whether it includes windbreaks or not.

Windbreaks or shelterbelts have met a variety of needs:

- Taking some of the sting out of drought conditions;
- Protecting crops including flowers and ornamental plants;
- Protecting livestock, helping them gain weight more consistently and hold their weight during blizzard conditions.
- Cutting fuel costs as much as 30 percent around the home in winter and helping cool the home in summer.
- Adding wildlife habitat and pleasant scenic patterns to the landscape.

Yet windbreaks aren't being planted fast enough; about as many in some places are coming down as are being planted. As I told the symposium, this is a bad year to be standing still in wind erosion control, in property protection, and in safeguarding crops and livestock.

Some windbreaks are coming down for good reason—they have become unsightly or ineffective (or both) because of disease, age, chemical sprays, or poor maintenance . . . or they sap too much moisture from crops. Some are being replaced with other, better windbreaks. Some are being replaced with other, better conservation practices in places where windbreaks didn't prove adaptable.

Other windbreaks are coming down for reasons the landowner thinks are good—to put more land into production . . . to install bigger irrigation systems . . . to enable him to use bigger farming equipment. He thinks high land values and good commodity prices will offset any impacts of windbreak removal.

We need to give these landowners accurate information quickly to make sure they understand the trade offs involved—economically and environmentally.

There are on-going programs of research, technical assistance, cost sharing, and public information; they need to be refocused and strengthened.

There are experienced leaders among district officials, private nurserymen and land improvement contractors in windbreak planting and renovation. They need to be encouraged to take an even stronger role.

Our goals need to be:

- All land protected from wind erosion through a system of conservation practices . . . there is no one panacea.
- All farmsteads with adequate protection from the wind.
- Windbreaks adequate to protect domestic animals.
- Windbreaks that give maximum benefit to birds and game.
- Windbreaks designed for maximum esthetic benefits.

We can help trees and shrubs make their maximum positive contribution to the environment and economy of the Plains—by aiding landowners with windbreaks that suit their needs.

I hope to see more windbreaks as I travel through the Plains during the months and years ahead. They may be different from those planted 100 years ago or 40 years ago, but they need be no less effective.

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Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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"Living Textbook" Opens in Pennsylvania

by Frederick Bubb Information officer, SCS, Harrisburg, Pennsylvania
and Clarence Wilson Area conservationist, SCS, Raleigh, North Carolina

"The Living Textbook" has pages that are often 80 feet tall and 100 years old, and always in living color. It's the name students have given the McKeever Environmental Learning Center near Mercer in western Pennsylvania.

Streams are among the study resources at McKeever.

The center covers 205 acres of native woodland, complete with a trout stream that flows through a stand of tall hemlocks. Its physical plant consists of a discovery center that has three indoor and two open-air classrooms, a dining hall for 120 people, three lodges that accommodate 120 overnight guests, and an auditorium that seats 200.

The McKeever Environmental Learning Center is owned by the Commonwealth of Pennsylvania. It is directed by a board of commissioners that represents Clarion, Edinboro, California, Indiana, and Slippery Rock State Colleges, the Sandy Lake Conservancy, the State Department of Education, and the State Department of Environmental Resources.

Dick Touvell directs the center, assisted by a teacher, a naturalist, an environmental educator, student teachers, and community volunteers.

The center opened last September and, by the end of December, 2,200 persons had come to study there for a few hours to a week. About 15 percent were college students and 40 percent were adults.

Adult groups have included educators, public officials, scout leaders, and conservationists. They come to the center from New York, Ohio, and West Virginia, as well as Pennsylvania.

"Our purpose is not to teach tree and bird identification," Touvell explained. "It is to teach environmental values and attitudes to teachers and students. For example, several weeks ago Clarion State College had a course here for its education students on methods of teaching social studies. This is the type of group that can help us achieve our goal. Working with adult leaders allows us to increase our impact."

Touvell noted that during one month the center's visitors

One of the three lodges at McKeever Environmental Learning Center

included engineering students from Westminster College who studied "social responsibilities of engineers," the faculty of Edinboro State College's English department who explored nature and literature, and the USDA Forest Service, which conducted its environmental education workshop for adults there.

The center encourages programs of several days. Some of the most satisfying learning experiences occur in the evenings when groups gather around a roaring fire in the lodge to discuss the day's happenings. The informal setting encourages more discussion, said Touvell.

The idea for the center began in 1964 with Ivan McKeever, then SCS state conservationist for Pennsylvania, and six local residents, all members of the Sandy Lake Conservancy. The group located a site for the center and then began working to make the idea a reality. Several local residents even signed a note for the loan to purchase the property until the state legislature appropriated funds for the center.

The physical plant, started in 1971, was built at a cost of $1.3 million. Cooperating colleges provided desks, chairs, beds, and other equipment for the center.

When the Penn Soil Resource Conservation and Development (RC&D) executive committee began operations in the area, the McKeever Center became one of its main efforts. Through the RC&D program, multicounty support was obtained for the center.

At first, operating funds for the center were a problem. As Touvell said, "For a time I was the only employee. I was janitor, cook, dishwasher, teacher, and administrator. If it weren't for local residents who volunteered their help, I never would have made it.

"You have to give the local people credit. They really wanted this center, and they wanted it to succeed."

Because of the cooperation of the state and local people, RC&D, and regional colleges, "The Living Textbook" has made a successful start. As its brochure claims, it is a place where not only the fifth grader but also the research scientist can find inspiration, solitude, and a near-perfect environment. ♦

Mr. Wilson was formerly coordinator for the Penn Soil Resource Conservation and Development area, Clarion, Pennsylvania.

Harvesting a Hobby

by Morris S. Gillespie
Information officer, SCS, Auburn, Alabama

What started out as a hobby has resulted in more than 1 million pine seedlings being planted by Alabama's Rush Smith—and most of them by hand.

Smith took up timber stand improvement as a hobby more than 40 years ago, and he's been a cooperator and supervisor with the St. Clair County Soil and Water Conservation District (SWCD) almost ever since.

Today, his tree farming operation has expanded to 11 farms on 1,700 acres. And the first seedlings he planted are beginning to return a profit.

"Planting trees is a long-term investment," he said. "I first got interested in tree farming after buying 52 acres of woodland right after I was married 22 years ago."

He bought the land with a loan from the Farmers Home Administration and recalls how difficult it was to make payments. The land cost about $50 an acre then; today, such land is selling for $700 an acre, Dr. Smith said.

He's removed all the fencing on his land and put in trees except where he maintains a pasture for his children's horse. His farms are in three counties and within a 15-mile radius of his home in Ashville, 40 miles northeast of Birmingham.

He's a cooperator with the three soil and water conservation districts in which he farms: Bounty County, Etowah County, and St. Clair County. He has been a supervisor of the St. Clair SWCD since 1958, and has conservation plans on all his farms.

Dr. Smith has arranged his schedule as a chiropractor so that he can look after his farms and participate in community projects. His wife teaches business administration at a nearby vocational school. They have three children—a 14-year-old daughter and two sons, ages 17 and 20.

Smith has been a representative for St. Clair County on the Coosa Valley Resource Conservation and Development Council for several years and was elected chairman last July.

He's been instrumental in getting many projects completed for the improvement of the county. One is the Ashville Flood Prevention Measure No. 1 that has controlled flooding and provided drainage for mosquito control.

"Before the Ashville project was completed," said Ashville Mayor Joe Atkins, "it took about a week for the floodwater to flow down following floods. Now it runs off in about 24 hours. Residents could not

Rush Smith

enjoy themselves outside their homes at night due to mosquitos from the swamp; mosquitos are no problem now."

For his tree farming operation, Dr. Smith has purchased loblolly pine seedlings from the State Forestry Commission nurseries. He has planted all but 200 acres by hand.

"There is very little expense after the trees are planted," he said. "Before planting, we kill the scrub hardwood trees."

He began harvesting on his "long-term investment" last year. He is thinning some of the first plantings of trees, cutting about a third of the stems. This yields about $70 an acre—10 cords at $7 a cord for pulpwood. The purchaser bears the cost of harvesting operations.

"We used to do our own harvesting and sell in Rome, Georgia, but due to the labor situation, we now sell all trees on the stump," Dr. Smith said. He plans to thin again in about 7 years and then the remainder will be ready for sawtimber in 10 more years.

Smith's interest in conservation extends far beyond woodland management. He's built a lake, four ponds, has one more under construction, and is planning two more. In addition to recreation, the ponds offer water for fire protection for his trees.

"All were built to meet SCS specifications," he said. "During a flood about 10 years ago, many pond dams in St. Clair County were washed out, but none constructed to SCS standards was lost. All my ponds held up well."

The lakes are a center for many activities in the community. All are stocked with bass and bluegill and one is stocked with channel catfish. A local church uses the lake on top of Chandler Mountain for baptismal services. Families living near use it for swimming.

Dr. Smith also is interested in wildlife management.

"I have four quarter-acre plots of bicolor lespedeza for quail and leave all good hardwood trees in the hollows," he said. "We have plenty of food and cover for deer and wild turkeys in the area."

Dr. Smith has planted fescue, a good grass for erosion control around the pond dams. He also has planted sericea lespedeza, bicolor lespedeza, tick clover, and other plants for food and cover for wildlife.

Now, his 20-year-old son is interested in a career in soil and water conservation. And, much as his father got started, he's planting pine seedlings and starting timber stand improvement on nearby land his father recently gave him. ♦

Narrow Rows Reduce Runoff on Sorghum Fields

Narrow row spacing of dryland grain sorghum conserves water, cuts soil erosion significantly by reducing runoff, and increases crop yields, according to a study by USDA's Agricultural Research Service (ARS).

Spacing sorghum rows 27 to 30 inches apart provides an earlier and more complete leaf canopy than the conventional 40-inch rows. This leaf canopy intercepts more sunlight, breaks the force of falling raindrops, increases water intake by the soil, and reduces evaporation.

Measurements taken throughout the growing season showed little difference in soil water content between narrow and conventional row spacing. This suggests that sorghum planted in closer rows uses water more efficiently than sorghum planted in conventional rows.

The central Texas study showed that narrow row spacing increased yields of dryland grain sorghum by 15 to 20 percent over conventional spacing. It increased the value of the yield by $30 per acre. Narrow row spacing was done with conventional farming equipment and did not increase production costs.

The study was conducted by soil scientists John E. Adams, Joe T. Ritchie, and Earl Burnett, ARS; agricultural engineer Clarence W. Richardson, ARS; and agricultural engineer Gerald F. Arkin, Texas Agricultural Experiment Station at Temple. ♦

Coon Creek:

Marker in the Pages of Soil Conservation

A study underway in one of the nation's historic soil conservation areas indicates that stream sediment loads may not be reliable indicators of upland erosion.

The study is by Dr. Stanley W. Trimble, an assistant professor of geography at the University of California at Los Angeles.

The study area is in the Coon Creek watershed which, in 1934, became the first Soil Erosion Control Demonstration Area of the U.S. Department of Agriculture. Coon Creek is a tributary to the Mississippi River in the Driftless Area of Wisconsin.

Trimble brought 400 people up to date on his long-range research project recently at the Third Federal Inter-Agency Sedimentation Conference in Denver, Colorado, March 22-25.

The conference was sponsored by the sedimentation committee of the Water Resources Council. John Holeman, SCS geologist in Washington, D.C., was chairman of the conference. The first conference was held in 1947 and the second in 1963.

Trimble's paper was one of 46 presented in Denver. Symposium topics included sediment yield and sources, erosion and sediment control, physical and chemical properties of sediment, channel adjustments, and coastal zone sedimentation.

Trimble's study noted "the extraordinarily high rates of erosion and sedimentation which can exist under human disturbance, and conversely . . . that these high rates can be greatly mitigated."

Within the last few years, there has been little deposition of sediment in the valley, and the present rate may be less than 10 percent of the high rates of the 1920's and 1930's, Trimble noted.

"This decrease is primarily attributed to changes of land use and land treatment," he said. An important aspect of land treatment was the application of conservation measures on cultivated land.

Trimble found in his study of the watershed that, since the 1930's, the tributary channels have continued to erode, indicating that stream sediment loads may be partially attributable to channel rather than upland erosion.

Thus, he said, stream sediment loads may be dubious indicators of upland erosion rates even when sampled for more than a third of a century.

The area was selected for study because the effects of man's destructive, as well as constructive, activities were readily apparent. Also the area had been intensively studied in the 1930's and detailed baseline data were available. SCS has provided assistance in Trimble's study.

The Coon Creek watershed has been the subject of study for many, including Hugh Hammond Bennett, first chief of the Soil Conservation Service and Vincent E. McKelvey, present director of the U.S. Geological Survey. In 1938, Dr. S. C. Happ designed a comprehensive long-range study for the SCS of the sedimentation phenomena there. Although never completed as planned, the study showed the general magnitude and distribution of modern sediment and its relation to stream channel erosion, Trimble said.

Trimble's study, undertaken in 1974, is to (1) determine changes of stream and valley morphology since the 1938 study by resurveying as many old valley cross sections as can be recovered; (2) determine past and present rates of sediment storage and movement in streams and valleys; and (3) find how the morphology and sedimentation changes relate to changes of watershed land use and land treatment.

Copies of the Proceedings of the Third Federal Inter-Agency Sedimentation Conference are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161. Price is $23.75. ♦

In early 1934, Coon Valley was marked with rectangular fields and gully systems extending into the upland cultivated fields. The same area, in 1967, exhibits contoured and strip-cropped fields. Not visible are many other soil and water conservation practices, such as crop rotations, stubble mulching, and crop residue management.

by Diana Morse
Information Division,
SCS, Washington, D.C.

The Eads Bunch

They called themselves "The Eads Bunch," and in less than 3 months, they mapped the soils on more than half a million acres in the Great Plains. They assembled last January in the small town of Eads, Colorado, and proceeded to survey half of Kiowa County.

Stan Albee (not in photo)
Dave Alstatt
Dave Anderson
Paul Deutsch
Bev Foley
Bill Hawn
John Lesh
Don Murray
Mike Petersen
Darrell Schroeder
Katie Thorsheim
Les Williams

The U.S. Government has been mapping soils for more than 75 years, but this survey was unusual. In most, SCS soil scientists work singly or in pairs. For the special assignment in Kiowa County, however, 11 soil scientists—a third of Colorado's soil scientists—were sent to Eads in this sparsely settled county of 2,000 people.

The group was young, with a median age of 27. Four were relatively new to soil surveying, having mapped for less than a year. Yet these professionals, most graduates of Colorado State University, mapped at a rapid rate, averaging more than 1,800 acres per person per day.

They were led by the youngest SCS soil survey leader in the state, Dave Anderson.

"This has been a new experience for nearly everyone involved," said Tommie Holder, SCS's state soil scientist in Colorado.

Holder, a Texan, started the

Don Wickman, who joined the group late in March, with Don Murray.

Bev Foley in the office at Eads.

Kiowa County effort to speed up mapping in Colorado. Most of the soil scientists came from the western slope of the Rockies, where winter weather nearly eliminates outdoor work for soil scientists.

"There were two main benefits from this operation," Holder said. "First was production. We mapped 600,000 acres in 3 months in an area where we set a priority. We wouldn't have been able to do that without this special assignment.

"Second was the training opportunity."

Anderson, the 27-year-old leader and organizer of the group, agreed. He moved to Eads last August with his family to make arrangements for the "invasion." He lined up a mechanic for the 12 pickup trucks to be used in the operation, arranged office space, developed work assignments and training plans, set quality and quantity goals.

"He had to have a plan that could change from morning to afternoon," Holder said.

Anderson set the pace . . . and "The Eads Bunch" exceeded it.

One reason, said 25-year-old Katie Thorsheim, was the opportunity to talk with—and argue with—fellow soil scientists.

"Here, if we weren't sure of an exact soil series name, we'd gather a sample during the day and bring it back to the office to talk about.

"It's easy for a soil scientist to get very jealous of his map. It's like a work of art. You've done every part of it yourself and you don't want someone criticizing it.

"But when we'd get a chance to talk over questions every day as they arose and draw on the many years of experience here, we could map a little faster."

Two mornings a week, the group gathered in Anderson's office to discuss the areas they were mapping, raise questions, give and receive on-the-job training.

Then, each headed out to the field in his or her own dark green SCS pickup truck with a power probe on the back. To get around in planted fields, they had two motorcycles to drive between rows and avoid damage to crops.

The team, from 55-year-old Les Williams to 23-year-old John Lesh, spent their days alone in the field, mapping with augers and with the power probe. They missed only a few days because of inclement weather.

Ahead of and behind them was a strong support staff. Gale Garner "ran" ahead of them getting permission from farmers and ranchers for the soil scientists to map their soils.

"I made one telephone call and got turned down, and I never made another," said the 26-year-old native of Kiowa County. He set a pace for himself of personal contacts and

kept ahead of the "augerers and probers."

Bev Foley, another temporary employee, sent letters to all county landowners who lived elsewhere. She also did some lab work and indoor map work.

At the SCS area office in La-Junta, Don Moss, Anderson's supervisor, provided administrative support—from keeping time-and-attendance records to getting supplies into Eads as quickly as possible. Eads, with a population of 1,000, is about 160 miles east of Denver.

One of the reasons behind the accelerated soil survey was the interest by Kiowa County officials to get it done. Last year, they authorized $10,000 to speed the survey on 100,000 acres. They were interested in information on the suitability of soils for cropland and rangeland and on the location of flood plains.

"Most people can remember they had a flood in 1941 or 1942," Anderson said. "But the soils and vegetation give tangible indications of past flooding."

The best land in the county is Class III, which is suitable for continuous cultivation. Most of the land in the county is Class IV, suitable for limited cultivation, or Class VI, which is generally not suitable for cultivation.

"It's odd that people will farm their poorest soil," Anderson said. "Many put grass on their best soils and plant their crops on their worst, on their Class VI land."

The survey is already being used to provide such information to landowners. Not 20 feet away from where the soil survey crew files its information is the desk of Bob Hawn, SCS district conservationist in Eads. He has leaned over backwards to help the soil scientists and was the first to use their work. He began providing information on soils to county residents as soon as it arrived.

At left, Dave Anderson, who heads the soil survey operation at Eads, works with John Lesh in the field. Above, Katie Thorsheim checks soils.

In total, Hawn can look at maps covering 605,980 acres. The group also wrote 153 soil descriptions.

"It's probably one of the best documented surveys in terms of field notes and soil descriptions and samples," Holder said. "Dave knew they couldn't be there later."

Hawn's twin brother Bill was one of "The Eads Bunch" and temporarily named one of the best soils in the county "rant and rave."

That name held until the SCS soil correlator came from Denver to study it and give it an "official" name.

Hawn's "rant and rave" soil runs in a 3-mile-wide belt from the western end of the county and swings south. It's the best farmland in the county; hence

Hawn's naming it because "the farmers rant and rave about it."

The soil scientists found that it was productive because just the right amount of sand had been blown in and covered heavier loess soil, acting as a mulch and retaining moisture in this area of low rainfall.

Although the group varied widely in age and experience in soils mapping, they all had in common the new experience of the special assignment in Eads. It was a different life for most.

Katie Thorsheim had driven in from Golden near Denver with her pickup truck and sewing machine. She managed to make a down vest while she was there.

Most stayed in one of the two motels in town. Some brought their wives. John Lesh brought his dog Gooshner.

"The one thing that got depressing was the wind," Lesh said. "You couldn't see far ahead of you. Some reported they had gotten lost. You had to find a fence and follow it."

"In the western Plains," Anderson said, "you could walk 20 miles and not come to a house. And you could go 300 miles if you weren't checking a map and knew where to go."

The soil scientists, alone with their pickup trucks and their mapping, saw herds of pronghorn antelope and lots of coyote. They saw golden eagles, prairie dogs, and rattlesnakes. And in the western end of the county where there are reservoirs, they saw snow geese and ducks.

"It certainly ended better than it started," Anderson commented.

He recalled the start of the special assignment in November. Two 6-week assignments were planned, one to start in November and the other in January. But the soil scientists had been in the field less than half a day last November, after driving from the western half of the state, when one of the worst blizzards to hit the area began.

"We were snowed in for a week, drifts were so bad we couldn't map, and I sent them home until January," Anderson said.

The January detail, of course, was a successful one, and "The Eads Bunch" received a special commendation from the agency.

They're gone now, leaving only Dave Anderson, John Lesh, and Don Murray to map in a three-county area. Many will be back this year, however, to continue mapping Kiowa County.

The target date to complete field work is June 1977, allowing for such weather stoppers as last year's blizzard. ♦

Watch on Water Witches

Editor's Note: A brief reference to a Nebraska "water witcher" in "Calculating Conservation" (April 1976 SOIL CONSERVATION) has drawn several protests from engineers and geologists. In the interest of fair play, we are providing more than equal space to "anti-witch" comments contained in a letter from Paul H. Lehr, executive director of the National Water Well Association in Worthington, Ohio:

"The water well industry in America today supplies more than 110 million people with their daily drinking water. Ground water resources are now estimated to have a volume 30 times greater than that of our nation's surface water.

"The level of sophistication of our industry has grown as rotary well drilling machines have risen in cost to $150,000, and as complex analog-digital and electrical modelling techniques have been developed by such institutions as the U.S. Geological Survey to scientifically determine the nature and extent of our potential underground water resources.

"It is thus disturbing to read an article in such a fine magazine as SOIL CONSERVATION which still alludes to the location of underground water through the antiquated and unscientific technique of a 'water witcher' . . .

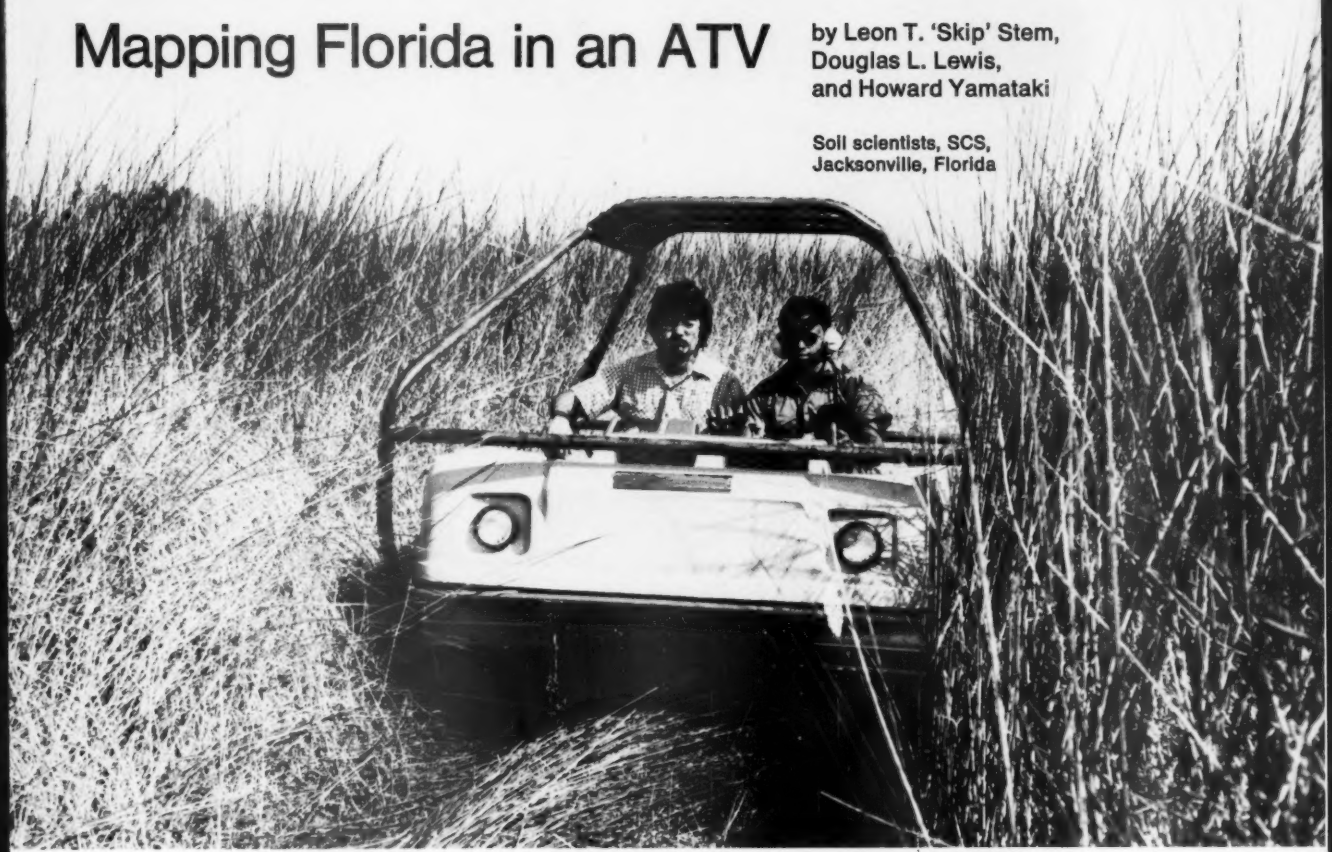
"Intensive scientific testing has long ago shown water witching to have no valid application whatsoever, and that its success is based on the natural elements of chance and luck alone. It is to no one's benefit to promote the continuation of a dark age, renaissance, Americana folklore in a scientific age where we have begun to conquer outer space . . .

"I would hope in the future that you would attempt to edit your fine magazine more closely. In turn, as editor of the journal of Ground Water (the world's leading research journal in ground water science) and as editor of the Water Well Journal (the leading industrial trade journal) I promise not to print any stories promoting a belief in the magical seeds of Jack and the Bean Stalk." ♦

Mapping Florida in an ATV

by Leon T. 'Skip' Stem,
Douglas L. Lewis,
and Howard Yamataki

Soil scientists, SCS,
Jacksonville, Florida



SCS soil scientists Howard Yamataki and David A. Howell map in the "little green ATV."

Conditions under which a soil scientist works are not always the best, even in the Sunshine State.

Needlegrass that can puncture skin and eyes . . . loose sand that can bog down vehicles . . . swampy areas that bog down vehicles and soil scientists.

That's why an all-terrain vehicle (ATV) has been so popular with the SCS soil scientists mapping in Duval County in northeastern Florida.

Its use is one of the reasons that the soil survey can be completed a year ahead of schedule.

Built for use in marshes, the ATV has 14-inch wide tracks made of flexible, one-piece molded rubber for maximum traction and minimum ground pressure.

In needlegrass and other thick and thorny flora, the ATV knocks down a path and provides a dry platform for soil investigations.

This is especially important in Duval County, which has 50,000 acres of tidal marsh at the mouth of the St. Johns River and along the Intercoastal Waterway.

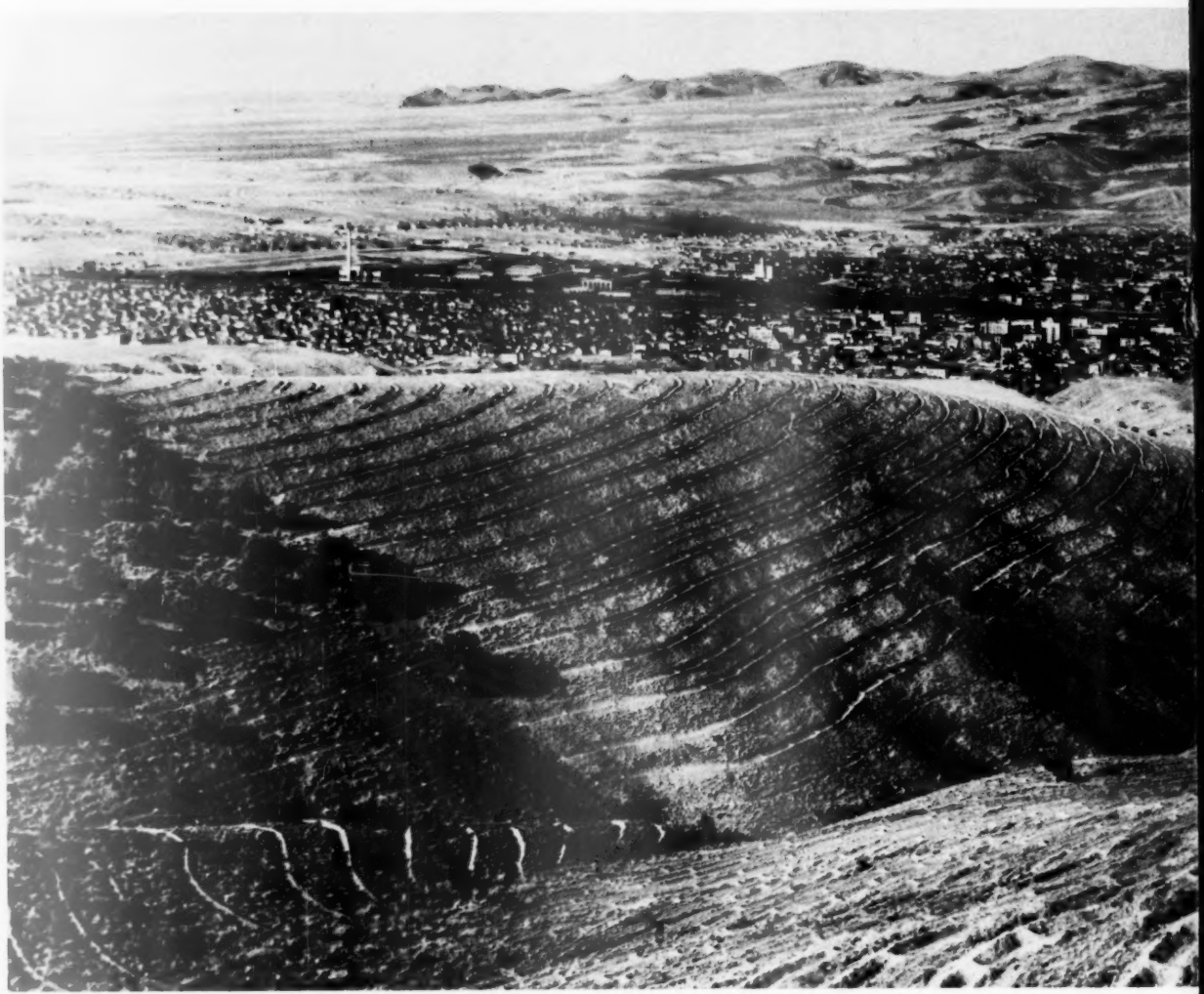
The soils in the tidal marsh have a very low bearing strength. The little green ATV is invaluable here, because it puts less than a pound of pressure per square inch on the ground even with the weight of two soil scientists, their equipment, and the vehicle.

On loose sand, such as beach dunes, the traction of the ATV lets soil scientists easily take slopes with grades up to 15 percent.

In the water, the top speed of the ATV is 2 miles per hour, and on land, 15 miles per hour.

Most of Duval County is flat and wet. The soil survey party has used the ATV in many other areas inaccessible to standard four-wheel drive vehicles, including wet pastureland and formerly mined areas that are now sand dunes.

The last hole will be bored for the Duval County soil survey this year, and all those mapping in the county will remember with fondness the "little green ATV." ♦



by Gale V. Roberts
District conservationist, SCS, Pocatello, Idaho

Continuing Conservation on the Pocatello Benches

Pocatello, second largest city in Idaho, has set new erosion and sediment control standards to preserve nearby prime agricultural land by guiding urban expansion on the bench terraces that overlook the city.

This photo, taken in April 1937, shows the contour furrows on the benches overlooking Pocatello. The furrows were put in with a team and plow and finished by Civilian Conservation Corps hand labor. They look much the same today.

City officials knew that Pocatello could either expand onto the agriculturally rich Tyhee Flats or onto the benches east and west of the city. The benches could provide housing for an estimated 55,000 people, but they are highly erodible and water running off the benches could flood Pocatello.

In 1973, the officials decided to encourage development on the benches, away from the Tyhee Flats. They built several water tanks on the benches and turned to the Portneuf Soil and Water Conservation District (SWCD) for help in avoiding erosion, sedimentation, and flooding.

The district helped develop the Pocatello Bench Sediment and Erosion Control Guide. The district asked the Soil Conservation Service to prepare a soil survey and used this and other technical information to prepare the guide, published on April 15, 1975. It contains definitions, recommendations, standards, and specifications for controlling erosion. It also includes engineering data for constructing runoff - retarding structures, such as sediment basins.

The city planning commission, city planning department, elected officials, contractors, and engineers are using the guide in planning and installing conservation measures.

Because each development is different, one combination of erosion and sediment control practices may work for one development but not for another. For this reason, the Portneuf SWCD board reviews the plans for each subdivision plot in Pocatello to make sure the conservation measures will be adequate for the particular design and location.

"This review process has proven successful," said Jerry Mason, planning director for the city. "It should insure protection for the bench area in years to come."

Concern for conservation on the Pocatello benches developed through experience. In the early 1900's, ranchers moved their livestock across the benches between winter grazing areas at a lower elevation and higher summer grazing areas. Townspeople grazed their horses on the benches year round.

The original vegetation was destroyed, and deep-rooted grasses were replaced by shallow-rooted annuals and bare ground. Because the vegetation was too sparse to hold the soil in place or to slow runoff water, the benches periodically subjected Pocatello to dust storms and disastrous floods.

Then, in the 1930's, residents and city officials requested the federal government to establish a Civilian Conservation Corps (CCC) camp in the area, and a flood control project was launched under the direction of the Soil Conservation Service.

By 1939, 850 miles of water-holding contour furrows spaced 20 to 50 feet apart had been constructed on the benches. Many were dug by hand or with horsedrawn plows. Grazing on the benches was stopped, and almost 10,000 acres were reseeded with deep - rooted grasses.

During periods of heavy rain, water was trapped in the furrows and gradually seeped into the soil or evaporated. The furrows, which are still visible, have protected the city from flooding for more than 35 years.

Although many of the furrows will be destroyed by development, city officials hope the conservation measures outlined in the guide and approved by the Portneuf SWCD Board will continue to protect Pocatello. ♦

Doughnuts for Ducks

by Allen Vaughn
Biologist, SCS, St. Paul, Minnesota

Doughnut-shaped stockwater dugouts may look strange to humans from the air, but they look inviting to waterfowl.

These popular ponds in the Northern Plains add diversity to the landscape.

Most of the dugouts are constructed as simple and inexpensive stockwater ponds in areas too flat to make embankment ponds feasible. Many of them are designed by the Soil Conservation Service and with cost sharing from the Agricultural Stabilization and Conservation Service.

The ponds average 6,000 square feet and are not more than 5 feet deep to accommodate shallow-feeding ducks and to encourage vegetation for food and cover. They usually are dug where there is a high water table to keep them full.

The dugouts are especially popular in the flyway areas in the western and central parts of Minnesota.

The ponds can be square, rectangular, circular, or any one of a number of other shapes, but the circular design with an island is one of the most popular. The islands are attractive loafing areas for ducks.

Some dugouts are constructed specifically for wildlife—usually waterfowl. The design then is modified to have more gradual slopes. This permits more shallow water for the growth of aquatic plants that supply food and cover for waterfowl.

Dugouts also attract other water-oriented birds, songbirds, mink, muskrat, raccoon, and deer. ♦

Verle Brady (center), his son Randy, and SCS District Conservationist Jerry Allen work on the plan that became the nation's 50,000th contract under the Great Plains Conservation Program.

50,000th GPCP Contract Signed in Oklahoma

by F. Dwain Phillips
Information officer, SCS, Stillwater, Oklahoma

When the 50,000th contract under the Great Plains Conservation Program (GPCP) was signed, it was appropriate that it was in Oklahoma.

This program has played an important role in conservation in that state for 19 years.

To mark the occasion, a ceremony was held in Freedom, Oklahoma, on March 27 to honor the 50,000th signers, Mr. and Mrs. Verle Brady, who own a 1,840-acre farm in western Oklahoma, not far from Freedom.

Edward E. Thomas, assistant administrator of the Soil Conservation Service, presented a commemorative plaque to the couple at the ceremony attended by more than 300 people.

"My biggest concern is to turn marginal cropland back to grass," said Brady, who grew up in the Dust Bowl.

The Bradys' plan includes planting more than 50 acres of cropland to grass, constructing 2,000 linear feet of diversion terraces, and instituting management practices. The land to be planted to grass is poorly suited to cultivation, Brady said, and the change will reduce erosion and eliminate the uneconomical part of the farm operation.

The Bradys plan to complete this work in 3 years. Plans under the Great Plains Conservation Program can take up to 10 years to complete.

Under the Great Plains Conservation Program, the Secretary of Agriculture has contracted with the Bradys to share the cost of needed soil and water conservation measures. In addition, the Bradys will receive special help in planning and applying the conservation work from the Soil Conservation Service's technical staff serving the Woods County Conservation District.

The purpose of the Great Plains Conservation Program (Public Law 1021) is to assist farmers and ranchers in carrying out, on a voluntary basis, plans to bring greater stability to their operating units. The plans spell out cropping and grazing systems to be followed and soil and water conservation practices to be applied.

Public Law 91-118 extended the program to the year 1981 and added provisions for enhancing fish and wildlife habitat and recreation resources, promoting the economic uses of land, and reducing agriculture-related pollution.

Oklahoma leads the nation in the number of active Great Plains Conservation Program contracts, with more than 2,600 as of December 31, 1975. Since the beginning of the program, 6,637 contracts have been written, covering 4,896,363 acres in the 30 western counties of the state. ♦

Pick Shin: on the Bicentennial Tour

by Frank Jeter, Jr.
Information officer
SCS, Raleigh, North Carolina

As part of the Bicentennial celebration, an outdoor classroom in North Carolina is drawing on the past for its buildings and furnishings.

Students and adults in hilly Surry County, northwest of Winston-Salem, are recreating farm scenes of yesterday at the Pick Shin Nature Center near the little town of Dobson.

Along the nature trail, they've put the small wooden Possum Trot Schoolhouse, an authentic 19th century schoolhouse. It was acquired by a neighbor in the community and transported to the nature center, where students completed the restoration.

Inside the schoolhouse is a pot-bellied iron stove. On chilly days it is fired up so students can hold classes there.

A genuine one-room country store, about 15 feet square, stands nearby. The goods for barter are provided by the students.

Another point of pride is a small log house (don't call it a cabin in these parts) first built and occupied in 1875 and recently moved to the nature center as part of a cooperative effort. Many of the furnishings, from the old water bucket to tea cups, are authentic.

Of course, some new building was necessary. Students built the two comfort stations, which are old-style outhouses with only a few modern conveniences added.

The center is included on the Bicentennial tour of the Piedmont area of North Carolina. To prepare for visitors, students are working hard to restore antique farm equipment and other symbols of the lifestyles of yesterday to pristine condition. They also are planning to add a museum of horse-drawn farm equipment to the center.

The Pick Shin Nature Center is more than a historic museum. It was originally planned as an outdoor classroom and environmental laboratory.

In 1973, the Surry County schools received a $10,000 grant for an outdoor classroom from the State Department of Administration. Work on the Pick Shin Nature Center began the following year with technical assistance from the Soil Conservation Service.

A total of 75 acres on the campuses of Surry Central High School and Surry Community College was set aside. So far, 30 acres have been developed as a nature center, and the other 45 acres are used for wildlife habitat.

Donald Vestal, vocational agriculture teacher at the high school, soon became involved in the project. Although students at all grade levels helped, Vestal's vo-ag classes spearheaded the work on the classroom.

Fred Patterson, SCS district conservationist for Surry County, provided the conservation information used as a basis for the entire nature area.

Community enthusiasm for the nature center and Bicentennial project was high almost from the inception. Ruritan Clubs in Surry, Wilkes, Yadkin, and Stokes Counties helped find antique farm equipment and home furnishings.

"In the near future, visitors will be able to see us churning real butter in old farm churns," said Charles Fletcher, supervisor of Surry County schools.

Conservation is a keynote of the Pick Shin Nature Center. Ed Brewer, SCS soil scientist in the Wilkesboro area office, worked with students to expose for study a natural soil profile in a slope along the trail. Conservation practices are demonstrated in several places around the nature center.

The center is used for subjects ranging from agriculture to creative writing and by all the local schools, from first grade to the community college level. In addition, people from neighboring counties come to take advantage of its unique learning opportunities. In the 1974-75 school year, some 7,300 students used the outdoor classroom.

The facilities are available 7 days a week, 12 months a year. The Pick Shin Nature Center is a favorite place at all seasons of the year. ♦

by John M. Cross
Head, Information Unit, Midwest Technical Service Center, SCS, Lincoln, Nebraska

Need for a New Approach Stressed at Great Plains Windbreak Symposium

What can be done to halt the removal of tree windbreaks on the Great Plains? Why are they being removed? These and other questions are bothering conservationists in the 10 Great Plains states and elsewhere.

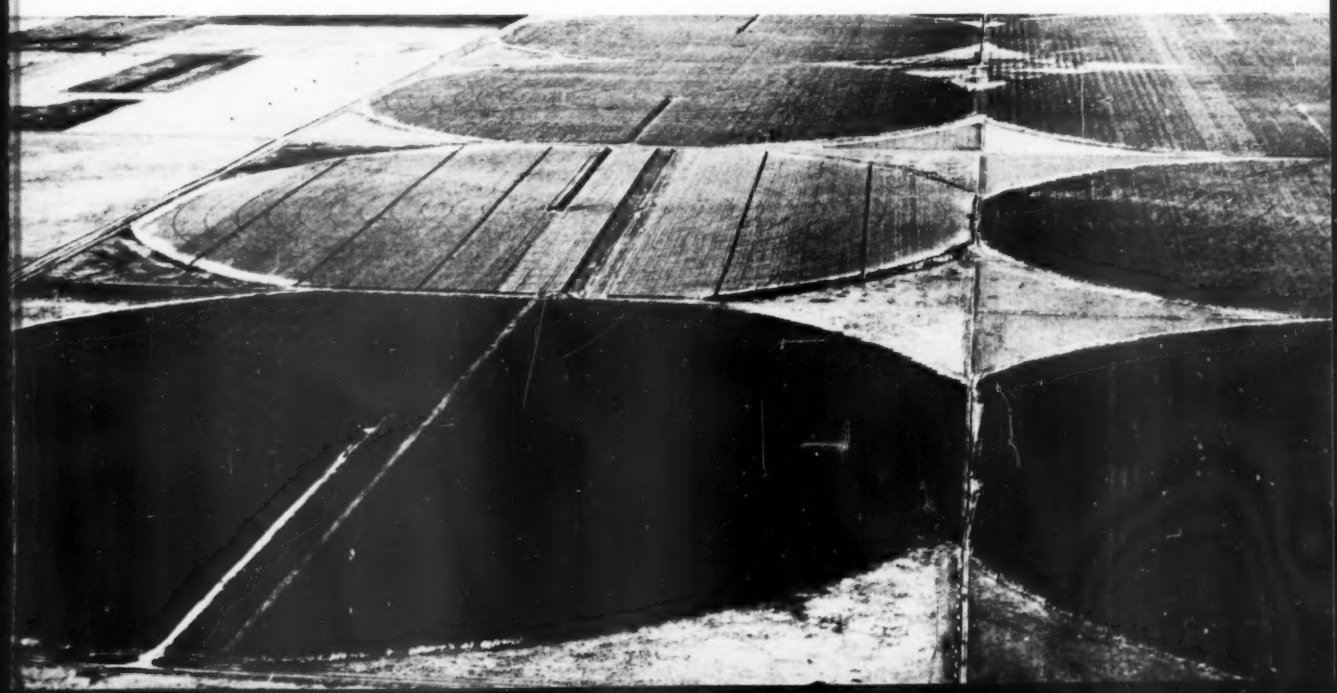
More than 120 conservationists, researchers, foresters, conservation district officials, and administrators met in a windbreak symposium in Denver, Colorado, April 20-22 to explore the situation. The meeting was sponsored by the Great Plains Agricultural Council, headquartered at Lincoln, Nebraska.

The problem was brought into focus by a 1975 report to Congress by the Comptroller General of the United States. The report followed a study made by the General Accounting Office (GAO).

"In the past 100 years, millions of trees have been planted on the Great Plains," the report stated. "In recent years some windbreaks, particularly those planted in the 1930's and early 1940's, have been removed. This has caused concern that continued removals will lead to increased soil erosion."

Supervisory auditor Larry Goldsmith of GAO, in his address to the symposium, said: "Unless action is taken to encourage farmers to renovate and preserve the existing windbreaks rather than remove them, an important resource which has taken many years to develop could be lost." Goldsmith participated in the original study.

Representatives of the Soil Conservation Service, Agricultural Research Service, and Forest Service, all in USDA, and of state land grant universities and state forestry agencies presented papers at the symposium. Lyle Bauer, a national



"... this is a bad year to be standing still in wind erosion control, in property protection and in safeguarding crops and livestock."
—R. M. Davis

spokesman for conservation districts and member of the USDA Public Advisory Committee on Soil and Water Conservation, and several other district representatives appeared on the program.

They reviewed recent progress in windbreak planting as well as pointing out needs for the future.

"As yet there is no crisis in windbreak removal but in some places almost as many are coming down as are going up," said SCS Administrator R. M. Davis in presenting an overview of the situation. "And this is a bad year to be standing still in wind erosion control, in property protection, and in safeguarding crops and livestock."

He pointed to the drought conditions on the Plains and the reports of accelerated damage from wind erosion.

Clearing tracks for center-pivot irrigation systems is one of the reasons for windbreak removal, according to the GAO report.

"We removed some trees for a center-pivot system," said Bryce Nedig, a farmer of Madison, Nebraska, but he admitted it was a somewhat less than ideal situation.

"We should once again be tree planters rather than windbreak removers," he said.

GAO compiled information in 16 counties in Oklahoma, Kansas, and Nebraska. Highest rate of removal was in Seward County, Nebraska, where 13.3 percent of existing windbreaks have been removed in the last 5 years.

SCS District Conservationist Bob Chilvers of Neligh, Nebraska, told the group there were 459 miles of windbreaks planted in Antelope County before 1950, and 503 miles planted since then. Since the first center-pivot irrigation system was installed in 1955, 35 percent of the later single-row windbreaks have been removed. Farmers are cutting half-moon notches in some of the older multiple-row windbreaks in order to let circular sprinklers pass through.

Some 27 miles of the older plantings have been removed entirely at a cost of $300 to $350 per acre to the farmer. The four-county northeast Nebraska area has 2,600 center-pivot irrigation systems.

Chilvers outlined modified planting patterns being used in the Upper Elkhorn Natural Resource District. Triangular windbreaks on the northwest and northeast corners of the fields under irrigation help stop wind and snow and provide 6-acre plots for livestock protection, wildlife habitat, hay, or extra grazing.

Arc-shaped rows of trees on the southwest and southeast corners of the circle break the south winds. Some farmers are planting the entire 6-acre plots to Christmas trees.

"We need new varieties of plants that will grow no taller than 8½ feet even with extra water and fertilizer. Then we can put single-row windbreaks across the circle and the system will pass over it," he said.

Trials with red cedar kept trimmed to 8½ feet have offered temporary help but the trees grow fast and will soon have to be removed. Several varieties of roses are being observed.

But there are other reasons why windbreaks are being removed.

"NACD did a quickie survey when we first heard of the GAO report," said NACD Vice President Bauer. "We found that more windbreaks were being removed because of age, changes in farming, diseases, and insects than in capricious efforts to gain more land for farming," he added. They also found more trees being planted than being removed.

The symposium speakers said the push for more land was not an important factor in removal. The small acreage gained hardly pays the cost of removal, they commented. But they did agree that the age, disease, insect, and irrigation problems are real. They concluded that more research is needed on these questions.

"Technical support for the windbreak program has suffered in recent years," said Bauer. "Nearly all research has been phased down or phased out."

"Incentives are far more effective than regulation as a means of resource management," Bauer said.

He said that America's conservation districts would support programs of information, research, land treatment, financing, and organization to reverse the trend in windbreak removal.

The philosophy that windbreaks alone do not make a complete conservation program was agreed to at the symposium. Chilvers said that windbreaks team up with conservation tillage to keep maximum amounts of litter on the land, and with emergency practices to keep down wind erosion.

SCS Administrator R. M. Davis said that many of the annual erosion control measures are dependent upon

weather and that tree windbreaks are there on the job every year.

Other speakers discussed the use of annual crops and wind barriers. Many referred to shrub plantings that serve a variety of uses. Several reviews pointed to new varieties and new nursery techniques available.

"There is a need for a new approach resulting from fresh concerns coming out of the GAO report," said Dr. Ken Gilles, vice president of North Dakota State University and chairman of the Great Plains Agricultural Council, in summarizing the meeting.

He charged the symposium committee and the forestry committee with responsibility for bringing full reports and recommendations to the Great Plains Agricultural Council's executive committee, which meets in Big Sky, Montana July 27-28. Suggested actions then will be forwarded to the membership for implementation.

Three urgent needs surfaced at the symposium: (1) an effective information and education program to urge landowners to reevaluate windbreaks; (2) new research into windbreak renovation and more adapted species for the changes in farming; and (3) accelerated technical and financial assistance to implement these programs. ♦

Meetings:

June

1–3 *"The Role of Phosphorus in Agriculture" Symposium, Muscle Shoals, Ala.*

3–4 *National Meeting of Keep America Beautiful, Inc., Dearborn, Mich.*

6–10 *American Society of Landscape Architects, San Diego, Calif.*

7–9 *American Plywood Association, Portland, Oreg.*

13–18 *Eighty-fifth Annual General Federation of Women's Clubs Convention, Philadelphia, Pa.*

20–25 *American Water Works Association Ninety-sixth Annual Conference, New Orleans, La.*

21–23 *Garden Club of America Sixty-third Annual Meeting, Minneapolis, Minn.*

26–30 *National Association of Counties, Salt Lake City, Utah*

26–July 1 *American Seed Trade Association, Inc., Convention, Los Angeles, Calif.*

27–29 *American Society of Farm Managers and Rural Appraisers Summer Meeting, Elizabethtown, Pa.*

27–30 *Sixty-ninth Annual Meeting of American Society of Agricultural Engineers, Lincoln, Nebr.*

27–30 *Twenty-third National Watershed Congress, Biloxi, Miss.*

27–July 1 *Air Pollution Control Association Sixty-ninth Annual Conference & Exhibition, Portland, Oreg.*

27–July 1 *Fortieth Annual Educational Conference of National Environmental Health Association, Nashville, Tenn.*

July

10–14 *American Association of Nurserymen, Inc., Boston, Mass.*

11–15 *American Society of Landscape Architects, San Diego, Calif.*

14–17 *Izaak Walton League, Baltimore, Md.*

26–30 *Symposium on Urban Flood Plain Management, Lexington, Ky.*

August

1–4 *Soil Conservation Society of America, Minneapolis, Minn.*

10–12 *Symposium on Inland Waterways for Navigation, Flood Control, and Water Diversions, Fort Collins, Colo.*

15–18 *American Agricultural Economics Association, University Park, Pa.*

15–18 *National Farm and Power Equipment Dealers Association, St. Louis, Mo.*

15–19 *National Association County Agricultural Agents, Richmond, Va.*

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